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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,138	01/22/2004	Robert Vincent	BOW1335-048	6409
45684	7590	01/10/2006	EXAMINER	
ROGER A. GILCREST 250 WEST STREET COLUMBUS, OH 43216-7513			FERNANDEZ, SUSAN EMILY	
			ART UNIT	PAPER NUMBER

1651

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/763,138	VINCENT, ROBERT	
	Examiner	Art Unit	
	Susan E. Fernandez	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17, 38, 40, 42 and 43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-17 is/are allowed.
- 6) ☒ Claim(s) 38, 40, 42 and 43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The amendment filed October 24, 2005, has been received and entered. The text of those sections of Title 35, U.S. Code, not included in this action can be found in a prior office action.

Claims 1-17, 38, 40, 42, and 43 are pending and are presented for examination.

Claim Rejections - 35 USC § 112

Claims 42 and 43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 42 is indefinite because the recitations of “said respective amounts of light” at the second and third lines of (b) lack antecedent basis. It is suggested that the recitations be replaced with “the respective amounts of light.” Additionally, the last three lines of claim 42 are particularly confusing. First, the claim recites “the sum of the ratio of the amount of light at the first of said wavelengths to the amount of light at the second of said wavelengths,” without indicating what variable(s) is/are added to the “ratio of the amount of light at the first of said wavelengths to the amount of light at the second of said wavelengths” to obtain a sum (which requires the summation of at least two variables). Moreover, the last three lines of the claim require a “quantitative relationship between the sum...,” but does not recite what the sum is quantitatively related to. Therefore, it is unclear what is defined by the algorithm. It appears that the claim is referring to the quantitative relationship between **the amount of said phycocyanin-pigmented algae or bacteria in said water AND** the sum of the ratio (amount of light at first

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wavelength / amount of light at second wavelength) and other variable(s). Thus, claims 42 and 43 are rejected under 35 U.S.C. 112, second paragraph.

Claim 43 is indefinite because the recitation "measurement" defines the act of measuring. Thus, it is unclear how an algorithm can comprise a measurement. Furthermore, it is unclear what type of light is measured. Is it the reflected light from said water? Additionally, lines 4 and 5 of the claim recite "said algorithm comprises a quantitative relationship between the sum of the following ratios," but the claim does not recite what the sum is quantitatively related to. Therefore, it is unclear what is defined by the algorithm, or how the measurements of claim 43 are related to the measurements of claim 42. It appears that claim 43 is referring to a method according to claim 42 wherein said measurement of reflected light from said water comprises a measurement of the respective amount of light in the band recited in claim 43 ((i)-(iv)), and wherein said algorithm comprises a quantitative relationship between **the amount of said phycocyanin-pigmented algae or bacteria in said water AND** the sum of the ratios recited in claim 43.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 38, 40, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gitelson et al.

Gitelson et al. teaches an equation for the calculation of biomass (equation 1, page 832, second column), which includes the sum of the reflectance above the base line (SUM) through 0.670 and 0.950 μm , where reflectance is a measurement of reflected light from water containing the biomass. Moreover, this sum includes the reflectances for at least two of wavelength ranges of from 0.670 and 0.950 μm (as required by claims 38 and 42), and includes the reflectances for three wavelengths (as required by instant claim 40). This biomass would have comprised of biomass containing phycocyanin. The equation is useful for the determination of the biomass of *Spirulina*, which is phycocyanin-pigmented algae, thus the equation is appropriate for any specific pigmented microorganism.

Gitelson et al. does not expressly disclose applying an algorithm comprising a quantitative relationship between the sum of ratios of reflectances and the amount of phycocyanin-pigmented algae or bacteria in water.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have used the reflectance data obtained in the Gitelson study to derive an algorithm relating the sum of ratios of reflectances to the amount of phycocyanin-pigmented algae or bacteria in water.

One of ordinary skill in the art would have been motivated to have applied other fitting algorithms besides linear regression which are well known in the field of mathematical modeling in order to arrive at more accurate methods of assessing population dynamics.

Applicant's arguments filed October 24, 2005, have been fully considered but they are not persuasive. The applicant argues that Gitelson et al. does not teach or suggest obtaining separate reflectance values. However, in order to obtain the SUM required by Gitelson et al.,

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measurements had to have been separately taken at a minimum of two wavelengths in the 670-950 nm range. Furthermore, one of ordinary skill in the art would have been led to have used the sum of ratios of the reflectance quantities at two or more different wavelengths since the use of ratios is a known analytical technique in the mathematical analysis of different types of data in various fields, particularly in the field of correlating reflectance data with numerous variables (such as chlorophyll concentrations). Thus, a holding of obviousness is clearly required.

Claims 1-17 are in condition for allowance.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan E. Fernandez whose telephone number is (571) 272-3444. The examiner can normally be reached on Mon-Fri 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Susan E. Fernandez
Assistant Examiner
Art Unit 1651

sef



FRANCISCO PRATS
PRIMARY EXAMINER